

### **Amendments to and Listing of Claims:**

Claims 1-5, 7-8, and 11-15 have been amended, claims 17-22 have been added, and claims 2-13, 15, and 17-22 have been withdrawn pending allowance of independent generic claim 1, and independent linking claim 16.

This listing of claims will replace all prior versions, and listings, of claims in the application:

### **Listing of Claims:**

1. (Currently Amended) An assembly in which adjacent panels are supported by underlying support structure in overlapping edge relationship to form a standing seam assembly with a sidelap shear capacity resistant to ~~sideslipping~~ side slipping when subjected to applied forces, the assembly comprising:

- a first panel having a female sidelap portion comprising a female cavity and a downwardly angled leg with hook portion adjacent said cavity;
  - a second panel ~~having comprising~~ a male sidelap portion having a tang portion extending from a fifth leg portion lockingly disposed in the female cavity of the first ~~roof~~ panel thereby, said downwardly angled leg with hook portion in conjunction with said tang portion forming providing a standing seam between the first and second panels formed by pressing said downwardly angled leg with hook portion into mating contact with said tang portion and folding said mated downwardly angled leg with hook and tang portions into adjacency with said fifth leg portion, the first female sidelap sidelap portion further forming a first leg portion, the said assembly with the sidelap shear capacity formed by downwardly forming the standing seam to create an acute angle with respect to ~~the said~~ the said first leg portion; and
- means for increasing the sidelap shear capacity of the standing seam assembly.

2. (Currently Amended) The ~~standing seam~~ of assembly of claim 1 wherein, in which the means for increasing sidelap shear capacity of the assembly comprises:

at least one pair of ~~backer~~ plates, one against each of the female sidelap portion and the male sidelap portion of the first and second ~~roof~~ panels, respectively; and fastening means interconnecting the pair of backer plates for exerting a pressing force against and sandwich the female sidelap and male sidelap in the standing seam.

3. (Currently Amended) The ~~standing seam~~ of assembly of claim 1 ~~wherein, in~~ which the means for increasing sidelap shear capacity of the assembly comprises:  
a cinch plate disposed on one of the first and second ~~roof~~ panels;  
a backer plate extending under the first and second ~~roof~~ panels; and  
fastener means extending through the ~~supporting roof panel~~ for interconnecting the cinch plate, the selected panel, and the backer plate to secure and sandwich the ~~supporting roof panel~~ to between the backer plate and the cinch plate.

4. (Currently Amended) A standing seam roof assembly in which adjacent roof panels are supported by underlying support structure in overlapping edge relationship to form a standing seam assembly with a sidelap shear capacity resistant to side slipping when subjected to applied wind ~~uplift~~ forces, the standing seam roof assembly comprising:

a first roof panel having comprising a female sidelap portion which forms a male insertion cavity and a downwardly angled leg with hook portion adjacent said male insertion cavity;  
a second roof panel having comprising a male sidelap portion having a tang portion extending from a fifth leg portion receivingly lockingly disposed in the male insertion cavity ~~to form the standing seam assembly~~, said downwardly angled leg with hook portion in conjunction with said tang portion providing a standing seam between said first and second panels formed by pressing said downwardly angled leg with hook portion into mating contact with said tang portion and folding said mated leg with hook and tang portions into adjacency with said fifth leg portion, the ~~first female sidelap~~ sidelap portion further forming a first leg portion, ~~the~~ said standing seam assembly with the

sidelap shear capacity formed by downwardly forming the standing seam to create an acute angle with respect to the first leg portion; and means for increasing the sidelap shear capacity of the standing seam assembly.

5. (Currently Amended) The standing seam roof assembly of claim 4 wherein the means for increasing sidelap shear capacity comprises:

a plurality of backer plates disposed against the female sidelap portion and the male sidelap portion on opposing sides thereof; and fastening means interconnecting ~~pairs the~~ said opposing backer plates and sandwiching the female sidelap and male sidelap in pressing engagement to increase ~~resistance~~ sidelap shear capacity of the standing seam to slipping.

6. (Previously Presented) The standing seam roof assembly of claim 4 wherein the means for increasing sidelap shear capacity comprises:

a backer plate extending under the roof panels; and fastener means connecting the backer plate and the roof panel.

7. (Currently Amended) The ~~standing seam~~ assembly of ~~Claim~~ claim 1 wherein the ~~assembly is a metal~~ standing seam roof assembly is metallic.

8. (Currently Amended) ~~A standing seam roof assembly in which adjacent roof panels are supported by underlying support structure in overlapping edge relationship to form standing seams between adjacent roof panels, the roof panels with a sidelap shear capacity resistant to sideslipping when subjected to uplift forces, the standing seam roof assembly comprising:~~

~~a first roof panel having female sidelap portion means forming a male insertion cavity;~~

~~a second roof panel having male sidelap portion means forming a male insertion portion lockingly engageable in the male insertion cavity, wherein the male sidelap portion is inserted into the male insertion cavity to form a standing~~

~~seam assembly joining the first and second roof panels, the first female sidlap portion forming a first leg portion, the roof panels with the sidlap shear capacity formed by downwardly forming the standing seam assembly to create an acute angle with respect to the first leg portion; and means for increasing the sidlap shear capacity of the adjacent roof panels.~~

A standing seam roof assembly with sidlap shear capacity resistant to side slipping comprising:

a first panel having a female sidlap portion comprising a first leg portion, a female cavity, and a downwardly angled leg with hook adjacent said female cavity;  
a second panel interacting with said female cavity, said second panel comprising a male sidlap portion having a fifth leg portion with a tang extending therefrom, said angled leg with hook in combination with said tang providing a standing seam between said panels formed by pressing said angled leg with hook into mating contact with said tang and folding said mated leg with hook and tang into adjacency with said fifth leg portion, the standing seam roof assembly with sidlap shear capacity formed by downwardly forming the standing seam to create an acute angle with respect to the first leg portion; and  
means for increasing the sidlap shear capacity of the standing seam assembly.

9. (Previously Presented) The standing seam roof assembly of claim 8 wherein the means for increasing sidlap shear capacity of the adjacent roof panels comprises:

at least one pair of backer plates disposed on opposing sides of the standing seam and against the female sidlap portion and the male sidlap portion of the first and second roof panels; and

fastening means interconnecting the backer plates for sandwiching the female sidlap and male sidlap in the standing seam to increase the frictional force there between.

10. (Previously Presented) The standing seam roof assembly of claim 8 wherein the means for increasing sidelap shear capacity of the adjacent roof panels comprises:

a cinch plate disposed on one of the first and second roof panels;

a backer plate extending under the first and second roof panels; and

fastener means extending through the supporting roof panel for interconnecting the cinch plate and the backer plate to sandwich the supporting roof panel to the backer plate.

11. (Currently Amended) ~~A roof having adjacently disposed panels supported by underlying support structure in overlapping edge relationship to form standing seam assemblies each with a sidelap shear capacity between adjacent roof panels, comprising:~~

~~each roof panel having a female sidelap portion forming a male insertion cavity;~~

~~each roof panel having male sidelap portion forming a male insertion portion~~

~~lockingly engageable in the male insertion cavity of the roof panel adjacent thereto, wherein the male sidelap portion is inserted into the male insertion cavity to form the standing seam assemblies joining the adjacently disposed roof panels, each first female sidelap portions forming a first leg portion, each standing seam assembly with the sidelap shear capacity formed by downwardly forming the standing seam assembly to create an acute angle with respect to the first leg portion; and~~

~~means for increasing the sidelap shear capacity of each standing seam assembly.~~

A roof having adjacently disposed panels supported by underlying support structure in overlapping edge relationship to form standing seam assemblies each with a sidelap shear capacity between adjacent roof panels, comprising:

each roof panel comprising a female sidelap portion with a first leg portion, a male insertion cavity, and a downwardly angled leg with hook adjacent said male insertion cavity;

each roof panel further comprising a male sidelap portion having a fifth leg portion with a tang extending therefrom forming a male insertion portion lockingly engageable in the male insertion cavity of the roof panel adjacent thereto,

wherein the male sidelap portion is inserted into the male insertion cavity, said angled leg with hook in combination with said tang providing a standing seam between said panels formed by pressing said angled leg with hook into mating contact with said tang and folding said mated leg with hook and tang into adjacency with said fifth leg portion, each standing seam assembly with sidelap shear capacity formed by downwardly forming the standing seam to create an acute angle with respect to the first leg portion; and means for increasing the sidelap shear capacity of the standing seam assembly.

12. (Currently Amended) The standing seam roof assembly of claim ~~10~~ 11 wherein the means for increasing sidelap shear capacity of each standing seam assembly comprises: a plurality of backer plates disposed on opposing sides of each ~~standing~~ standing seam assembly and against the female sidelap portions and the male sidelap portions of the panels; and fastening means connecting pairs of the backer plates for sandwiching the standing seams to exert friction increasing pressure on the standing seams to resist slipping thereof when subjected to diaphragm loading.

13. (Currently Amended) The standing seam roof assembly of claim ~~10~~ 11 wherein the means for increasing sidelap shear capacity of each standing seam assembly comprises: a cinch plate supported on one of the roof panels between the standing seams; at least one backer member extending under the panels; and fastener means extending through the supporting roof panels interconnecting the cinch plates and the backer plates to sandwich the roof panels between the cinch plates and the backer plate.

14. (Currently Amended) The standing seam ~~of~~ assembly of claim 1 wherein the means for increasing sidelap shear capacity of the assembly comprises a roof clip in pressing contact adjacent a first side of a tang member of the male sidelap portion of the ~~second-panel-panel~~, the roof clip enclosing the distal end of the tang member while

looping back ~~on and pressingly engaging into adjacency with~~ a second side of the tang member to enclose ~~substantially all~~ a portion of the tang member.

15. (Currently Amended) A method for forming a standing seam assembly with sidelap shear capacity by steps comprising:

providing a first roof panel and a second roof panel adjacent the first roof panel;  
interlocking a female sidelap portion of the ~~adjacent~~ first panel with a male portion  
of the second ~~adjacent~~ panel, the female sidelap portion having a first leg  
portion;

~~pre-creasing~~ forming a downwardly angled leg with a hook portion of the female  
sidelap portion;

jointly forming ~~a tang member of the male sidelap portion and a third leg of the~~  
~~female sidelap portion~~ a fifth leg portion with a tang extending therefrom of  
the male sidelap portion;

~~creasing together the tang member of the male sidelap portion and the third leg of~~  
~~the female sidelap portion to form a standing seam~~ pressing the downwardly  
angled leg with hook portion into mating contact with the tang extending  
from the fifth leg portion and folding the resulting mated leg with hook and  
tang into adjacency with said fifth leg portion to form a standing seam; and

downwardly forming the standing seam to create an acute angle with respect to the  
first leg portion of the female sidelap portion to form ~~the standing~~ standing  
seam assembly with sidelap shear capacity.

16. (Previously Presented) A combination comprising:

a standing seam assembly with a sidelap shear capacity provided by steps for  
forming a standing seam assembly with sidelap shear capacity; and  
means for increasing the sidelap shear capacity of the standing seam assembly.

17. (New) The assembly of claim 1, in which the means for increasing sidelap shear  
capacity of the assembly comprises:

a plate communicating with the female sidelap portion of said interlocked first and second panels; and

fastening means exerting a pressing force on the male sidelap portion of said interlocked first and second panels for interconnecting and sandwiching together the plate, the female sidelap portion, and male sidelap portion.

18. (New) The assembly of claim 1, in which the means for increasing sidelap shear capacity of the assembly comprises:

a plate communicating with the male sidelap portion of said interlocked first and second panels; and

fastening means exerting a pressing force on the female sidelap portion of said interlocked first and second panels for interconnecting and sandwiching together the plate, the female sidelap portion, and male sidelap portion.

19. (New) The assembly of claim 1, in which the means for increasing sidelap shear capacity of the assembly comprises:

a backer plate extending under said interlocked first and second panels; and

fastener means extending through said interlocked first and second panels for interconnecting and sandwiching together said fastener means, said interlocked first and second panels, and said backer plate.

20. (New) The assembly of claim 1, in which downwardly forming the standing seam to create an acute angle with respect to the first leg portion increases the frictional force between said panels to provide the standing seam assembly with sidelap shear capacity.

21. (New) An assembly in which adjacent panels in overlapping edge relationship form a standing seam assembly with a sidelap shear capacity resistant to side slipping when subjected to applied forces, the assembly comprising:



a first panel having a female sidelap portion comprising a female cavity and a downwardly angled leg with hook portion adjacent said cavity; and  
a second panel interacting with said female cavity, said second panel comprising a male sidelap portion having a fifth leg portion with a tang extending therefrom, said angled leg with hook in combination with said tang providing a standing seam between said panels formed by pressing said angled leg with hook into mating contact with said tang and folding said mated leg with hook and tang into adjacency with said fifth leg portion, the standing seam assembly with sidelap shear capacity formed by downwardly forming the standing seam to create an acute angle with respect to the first leg portion, in which downwardly forming the standing seam to create an acute angle with respect to the first leg portion increases the frictional resistance between said panels to provide the standing seam assembly with sidelap shear capacity, thereby increasing a diaphragm strength of said assembly.

22. (New) An assembly in which adjacent panels in overlapping edge relationship form a standing seam assembly with a sidelap shear capacity resistant to side slipping when subjected to applied forces, the assembly comprising:

a first panel having a female sidelap portion comprising a female cavity and a downwardly angled leg portion adjacent said cavity; and  
a second panel interacting with said female cavity, said second panel comprising a male sidelap portion having a fifth leg portion with a tang extending therefrom, said angled leg in combination with said tang providing a standing seam assembly with sidelap shear capacity between said panels formed by pressing said angled leg into mating contact with said tang and upset crimping said tang into locking contact said angled leg, wherein said upset crimping increases the frictional retention forces between said panels to provide the standing seam assembly with sidelap shear capacity.